

REMARKS

Claims 1-9, 11, 13-19, 21 and 23-31 are pending in the case. The Examiner's reconsideration of the objection and rejections is respectfully requested in view of the amendments and the remarks.

Claim 28 has been objected for an informality, including a phrase that appears to be immaterial to the claim. The phrase "It will not only." has been deleted.

Claims 1-31 have been rejected under 35 U.S.C. 103(a) as being unpatentable over Grunenfelder et al. (USPN 6,097,701 [sic]) and G.R. Rajugopal/R.H.M Hafez (hereinafter Hafez). The Examiner stated essentially that the combined teachings of Grunenfelder and Hafez teach or suggest all the limitations of claims 1-31.

Claim 1 claims, *inter alia*, "discarding, during a run-time, a second frame without transmission over the network to the receiving client according to a time-stamp of the second frame, the time of transmission and the current time of the receiving client, wherein the time-stamp of the second frame is greater than the current time of the receiving client plus the time of transmission." Claim 11 claims, *inter alia*, "determining whether a next frame having a higher priority than the first frame, whose timestamp is greater than the first frame, can arrive at the client considering a time stamp of the next frame, the time of transmission and a current time of the client if the first frame is sent; and upon determining that the next frame can arrive, sending the first frame." Claim 16 claims, *inter alia*, "determining whether a top frame of the queue is sent to a client according to a latest start time of the frame and respective time stamps of a next frame of a later timestamp and a higher priority." Claim 21 claims, *inter alia*, "determining whether the frame can arrive at a client in time, depending on a frame timestamp, an

expected available bandwidth and a current time of the client, and determining whether a next higher priority frame can arrive at the client in time, if the frame is sent to the client, wherein the frame is discarded if the next higher priority frame cannot arrive at the client in time if the frame is sent.” Claim 24 claims, *inter alia*, “an automatic content analysis module for selecting a key-frame and ranking the key-frame according to a plurality of priorities; and a streaming server for selecting a frame during a run-time to send to a client according to a time of transmission, wherein the time of transmission is the time the frame will take to reach the receiving client.”

Grunenfelder teaches that connections have priorities and are weighted based on a time since a connection was last used (see col. 7, lines 21-46). Grunenfelder does not teach or suggest “discarding, during a run-time, a second frame without transmission over the network to the receiving client according to a time-stamp of the second frame” as claimed in claim 1, “upon determining that the next frame can arrive, sending the first frame” as claimed in claim 11, “determining whether a top frame of the queue is sent to a client according to a latest start time of the frame and respective time stamps of a next frame of a later timestamp and a higher priority” as claimed in claim 16, “determining whether a next higher priority frame can arrive at the client in time, if the frame is sent to the client, wherein the frame is discarded if the next higher priority frame cannot arrive at the client in time if the frame is sent” as claimed in claim 21 and “a streaming server for selecting a frame during a run-time to send to a client according to a time of transmission, wherein the time of transmission is the time the frame will take to reach the receiving client” as claimed in claim 24. Grunenfelder teaches the ranking of connections.

Grunenfelder does not teach ranking frames, essentially as claimed in claims 1, 11, 16, 21 and 24. Therefore, Grunenfelder fails to teach all the limitations of claims 1, 11, 16, 21 and 24.

More particularly, with respect to claim 1, Grunenfelder fails to teach or suggest discarding a second frame. Grunenfelder teaches FIFO and Round Robin Inquiry systems (see col. 4, lines 1-8). These systems progress through data in an ordered form, e.g., based on a longest wait time; these systems increase a weight of data over time; data is not discarded (see col. 7, 29-31). Thus, Grunenfelder does not teach or suggest discarding a frame, essentially as claimed in claim 1.

Referring to claims 11, 16 and 21; Grunenfelder teaches ranking connections (see col. 7, lines 21-24). Grunenfelder does not teach ranking frames, much less sending a first frame of a lower priority upon determining that a next frame of a higher priority will reach a client in time according to a time stamp and a current time of the client, essentially as claimed in claims 11, 16 and 21. Grunenfelder's method sends data based on for example, a wait time since each connection was last used and a precedence of each connection without regard for whether the data will be current upon reaching a client (see col. 7, lines 21-32). Therefore, Grunenfelder fails to teach or suggest "upon determining that the next frame can arrive, sending the first frame" as claimed in claim 11, "determining whether a top frame of the queue is sent to a client according to a latest start time of the frame and respective time stamps of a next frame of a later timestamp and a higher priority" as claimed in claim 16, "determining whether a next higher priority frame can arrive at the client in time, if the frame is sent to the client, wherein the frame

is discarded if the next higher priority frame cannot arrive at the client in time if the frame is sent” as claimed in claim 21.

With respect to claim 24; Grunenfelder teaches a method for ranking connections, wherein the rank comprises a wait time since each connection was last used and a precedence of each connection without regard for whether the data will be current upon reaching a client (see col. 7, lines 21-32). Grunenfelder “a streaming server for selecting a frame during a run-time to send to a client according to a time of transmission, wherein the time of transmission is the time the frame will take to reach the receiving client” as claimed in claim 24. Indeed, as noted in the Office Action, Grunenfelder did not explicitly disclose wherein selecting the frame comprises determining a time of transmission... Therefore, Grunenfelder fails to teach or suggest all the limitations of claim 24.

Hafez teaches an allocation of a bit budget over a wireless network (see page 35, col. 2, lines 1-15). Hafez does not teach the ranking of frames, essentially as claimed in claims 1, 11, 16, 21 and 24. Hafez teaches that a rate control is achieved based on orthogonal partitioning of wavelet coefficients and implementation of orthogonal sets in a zero tree to remove errors from a picture (see page 35, col. 1, lines 19-26). Hafez transforms video into frequency subbands and filters certain subbands to achieve a desired quality given the bit budget (see page 34, col. 2, lines 10-25). The subbands of Hafez do not correspond to frames; a subband relates to certain frequencies of a frame. Thus, Hafez does not teach or suggest an implementation for ranking frames. Therefore, Hafez fails to cure the deficiencies of Grunenfelder.

More particularly, with respect to claim 24, Hafez teaches adjusting a rate of a coder. Hafez teaches that frequency subbands may have different importance to the quality of a video stream (see page 34, col. 2, lines 10-25). Hafez does not teach or suggest “a streaming server for selecting a frame during a run-time to send to a client according to a time of transmission, wherein the time of transmission is the time the frame will take to reach the receiving client” as claimed in claim 24. The frequency subbands of Hafez are not frames. Frequency subbands are portions of frames. Thus, Hafez’s method may adjust the quality of a frame being sent. However, adjusting the quality of a frame according to a duration over which peak bit rate can be sustained is not analogous to selecting a frame according to a time of transmission, essentially as claimed in claim 24. Similar to Grunenfelder, Hafez will send all frames; Hafez adjusts the quality of each frame. Hafez does not teach selecting a frame according to a time of transmission. Therefore, Hafez fails to cure the deficiencies of Grunenfelder.

In view of the foregoing, the combined teachings of Grunenfelder and Hafez fail to teach or suggest “discarding, during a run-time, a second frame without transmission over the network to the receiving client according to a time-stamp of the second frame” as claimed in claim 1, “upon determining that the next frame can arrive, sending the first frame” as claimed in claim 11, “determining whether a top frame of the queue is sent to a client according to a latest start time of the frame and respective time stamps of a next frame of a later timestamp and a higher priority” as claimed in claim 16, “determining whether a next higher priority frame can arrive at the client in time, if the frame is sent to the client, wherein the frame is discarded if the next higher priority frame cannot arrive at the client in time if the frame is sent” as claimed in claim 21 and “a streaming server for

selecting a frame during a run-time to send to a client according to a time of transmission, wherein the time of transmission is the time the frame will take to reach the receiving client” as claimed in claim 24.

Claims 2-9 depend from claim 1. Claims 13-15 depend from claim 11. Claims 17-19 depend from claim 16. Claim 23 depends from claim 21; claims 25-31 depend from claim 24. The dependent claims are believed to be allowable for at least the reasons given for the respective independent claims. At least claims 2 and 13 are believed to be allowable for additional reasons.

Claim 2 claims, “determining a priority of each frame, comprising, determining a priority one frame according to a position in the video; and determining a priority two frame according to dynamic information in the video.” Claim 13 recites “determining, recursively, whether each frame of a second priority can be transmitted to the client, until a frame of a higher priority is sent according to timestamps, or no frames of the second priority with timestamps smaller than the timestamp of the next frame of the higher priority are in the queue.”

Referring to claim 2, Grunenfelder teaches a method for calculating a rank for each connection, wherein a rank comprises a mode class which determines a priority of a connection for packet departure and a weight of a connection that increases with each packet clock (see col. 2, lines 66 to col. 3, line 6). Grunenfelder does not teach or suggest “determining a priority of each frame, comprising, determining a priority one frame according to a position in the video; and determining a priority two frame according to dynamic information in the video” as claimed in claim 2. Grunenfelder ranks connections based on a wait time of the connection and the connections priority. Grunenfelder does

not rank frames or packets on the connections. Therefore, Grunenfelder fails to teach or suggest all the limitations of claim 2.

Hafez teaches a method for adjusting a quality of a video given a bit budget (see page 35, col. 2, lines 1-15). Hafez does not teach or suggest “determining a priority of each frame, comprising, determining a priority one frame according to a position in the video; and determining a priority two frame according to dynamic information in the video” as claimed in claim 2. Hafez’s method for adjusting quality by filtering subbands of video is not analogous to ranking frames. Hafez sends all frames but varies frame quality given a bit budget. Hafez does not teach or suggest ranking frames. Therefore Hafez fails to cure the deficiencies of Grunenfelder.

The combined teachings of Grunenfelder and Hafez fail to teach or suggest all the limitations of claim 2.

Referring to claim 13, Grunenfelder teaches a method for calculating a rank for each connection, wherein a rank comprises a mode class which determines a priority of packet departure and a weight that increases with each packet clock (see col. 2, lines 66 to col. 3, line 6). Grunenfelder does not teach or suggest “determining, recursively, whether each frame of a second priority can be transmitted to the client, until a frame of a higher priority is sent according to timestamps, or no frames of the second priority with timestamps smaller than the timestamp of the next frame of the higher priority are in the queue” as claimed in claim 13. Grunenfelder attempts to send packets from higher priority connections first and only considers lower priority connections once a time based weight of the lower ranked connection has sufficiently increased. Grunenfelder does not teach or suggest sending lower ranked connections first so long as the higher ranked

connection will be received by a client within a given time. Therefore, Grunenfelder fails to teach or suggest all the limitations of claim 13.

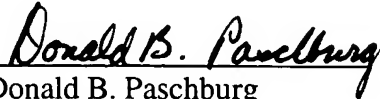
Hafez teaches a method for adjusting a quality of a video given a bit budget (see page 35, col. 2, lines 1-15). Hafez does not teach or suggest “determining, recursively, whether each frame of a second priority can be transmitted to the client, until a frame of a higher priority is sent according to timestamps, or no frames of the second priority with timestamps smaller than the timestamp of the next frame of the higher priority are in the queue” as claimed in claim 13. Hafez teaches filtering subbands of frequencies of a video. Hafez does not teach or suggest a method for sending frames based on a rank and time stamp. Therefore, Hafez fails to cure the deficiencies of Grunenfelder.

The combined teachings of Grunenfelder and Hafez fail to teach or suggest determining, recursively, whether each frame of a second priority can be transmitted to the client, until a frame of a higher priority is sent according to timestamps, or no frames of the second priority with timestamps smaller than the timestamp of the next frame of the higher priority are in the queue” as claimed in claim 13.

For the forgoing reasons, the present application, including claims 1-9, 11, 13-19, 21 and 23-31, is believed to be in condition for allowance. The Examiner's early and favorable action is respectfully urged.

Respectfully Submitted,

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